

REMARKS

After entry of this Amendment, claims 1 and 3-16, which have been previously allowed, are pending in this application. Claims 1, 3 and 15 are amended without introduction of new matter. The amendments are made after consideration of a Japanese Examination Report, dated June 2, 2009 and submitted with an Information Disclosure Statement filed concurrently with this amendment.

The Japanese Examination Report identifies Japanese Laid-open Patent Application No. JP 9-15049 to Yokogawa Electric Corp. (“Yokogawa”) in relation to the claims of the present application. However, as explained below, Yokogawa does not disclose the invention recited in the pending claims. Specifically, Yokogawa fails to disclose the combination of an element which rotatably oscillates back and forth and whose drive means is a galvanometer.

The present application explains that prior methods for varying the path length for a beam of radiation included using scanning delay lines with retro-reflectors which were linearly reciprocated. Retro-reflectors reflect a beam 180-degrees. By moving the retro-reflector back and forth along a line it was possible to change the length of the resulting delay line. Since the speed at which the delay line can be scanned dictates the time over which data can be collected, there was pressure for the delay line to operate more quickly. *See* Application, p. 1.

As it is difficult to move a retro-reflector back and forth at high speeds, another method for varying the delay line was desired. One solution is provided by a constantly rotating optic of the type described in Yokogawa. While the rotating optic type of delay line is able to quickly change the resulting delay path, these types of delay lines have a low duty cycle (range over which data can be collected) and the maximum and minimum delay introduced cannot be changed once the line has been assembled. Yokogawa, ¶ [0016].

According to Yokogawa, the Yokogawa method also improves upon a method for forming a delay line that uses a disc with two mirrors wherein the disc “rotatably reciprocates.” This method, as explained by Yokogawa, requires improvement because the rotatably reciprocating

delay line is too cumbersome to control and is unable to achieve high speeds. Yokogawa, ¶¶ [0002], [0007].

The present invention provides the desired improvement over the rotatably reciprocating method identified in Yokogawa. The invention recited in the pending claims provides an element which rotatably oscillates back and forth and is galvanometer driven. The invention allows the duty cycle to be improved and the minimum and maximum delay to be set after the delay line has been assembled. The provision of an oscillating delay line driven by a galvanometer allows the speed of the line to be controlled more easily than for a constantly rotating optic. This, in turn, allows for a variation of phase difference introduced by the delay line to be controlled linearly over time.

Using a galvanometer to drive the rotating element overcomes the problems described in Yokogawa regarding oscillating an element back and forth. A galvanometer comprises a coil located in a magnetic field. If the current is passed through the coil, the coil experiences a force proportional to the current passed through the coil. Therefore, the rotation imparted by a galvanometer allows the position of the element to be finely controlled. Further, since the torque applied to the element via the galvanometer is dependent on the current applied to the galvanometer, the speed of the element can be varied throughout each oscillation, thus allowing the element to vary the delaying length linearly with respect to time. This allows linear scanning of the element at frequencies up to 100 Hz. If the element is scanned sinusoidally, frequencies of 300 Hz to 400 Hz may be achieved.

Therefore, for at least these reasons, claims 1 and 15, which recite the use of a galvanometer, are allowable over the cited art. Claims 2-14 and 16 depend from claim 1 and are thus allowable for at least the same reasons that claim 1 is allowable.

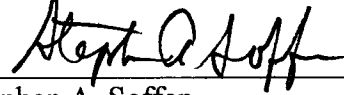
If the Examiner determines that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark Office determines that an extension is required, applicant petitions for any required relief including extensions of time and authorizes the

Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 04-1073 referencing docket no. M0025.0323/P323.

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